Systems Design Engineering
2019 Class Profile
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Systems Design Engineering (SYDE) is an engineering program unique to the University of Waterloo. Over the past 5 years, the class of 2019 spent 8 semesters in school together and completed 6 technical co-op work terms. The curriculum was interdisciplinary and covered a wide breadth of material, including courses from mechanical, electrical, and software engineering that were tied together with a design-focused curriculum.

This document extends the results of the SYDE 2017 and SYDE 2018 Class Profiles and aims to capture the story of the SYDE class of 2019. Because of its holistic and interdisciplinary nature, SYDE often means different things to different people. Through this survey, we hope to share our unique SYDE experience.
55 of 73 students (75%) are represented in this survey. Throughout the survey, any reference to “the class” carries the underlying assumption that this subset of respondents accurately represents our entire class. The results of this profile do not extend beyond the experiences of the respondents from the SYDE class of 2019 and the data does not necessarily generalize to other university students, nor even other SYDE cohorts. These results do not aim to make any inferences about a larger population, and attempt only to represent the class as it was.

The terms 1A, 1B, 2A, etc. refer to the semester of study, the number indicating the year and A or B indicating the first or second term. Co-op terms alternated with school terms and are denoted by a C following the semester the internship followed after (e.g. 2AC co-op refers to the internship term after the 2A semester). The SYDE class of 2019 started school in September 2014, making that the 1A term.

Any analysis involving money is expressed in Canadian dollars. The exchange rate used to convert from USD to CAD was 1.3 and was selected as a reasonable mean exchange rate over the relevant duration.

The class profile was conducted by SYDE students independent of the department, faculty, and university.
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Demographics

Home, Family, High School, and more
The mean, median, and mode birth year of respondents was 1996.
62% of the class was male and 38% was female.
Demographics: Ethnicity

Which ethnic background(s) do you identify with?

- East Asian: 36%
- White: 32%
- South Asian: 20%
- Middle Eastern: 5%
- Southeast Asian: 2%
Demographics: Where did you grow up?

The majority of respondents grew up in some part of Canada, with over half of the respondents growing up in the GTA.
Most of the class believes in something.
The class seems to be slightly left-leaning.
For most respondents, at least one of their parents holds a Bachelor's degree or higher.
Demographics: North American parents?

Were either of your parents born in North America?

- No: 60% of respondents
- Yes: 40% of respondents
Demographics: Household income

What was your parents' combined income at the time you entered university?

- Don't Know
- $300k+
- $250 - 300k
- $200 - 250k
- $150 - 200k
- $100 - 150k
- $50 - 100k
- $0 - 50k

Percentage of Respondents

0% 5% 10% 15% 20% 25% 30% 35%
Demographics: STEM Parents

Have your parents worked in a STEM-related field?

- Yes, engineering specifically: 60%
- Yes, but not engineering: 40%
- No: 0%

The apple doesn’t fall far from the tree.
Demographics: How much of your university expenses were family-funded?

How much of your university expenses were funded by your family?

- 81 - 100%
- 61 - 80%
- 41 - 60%
- 21 - 40%
- 0 - 20%

Percentage of Respondents

0%  5%  10%  15%  20%  25%  30%
Demographics: High school entrance average

This distribution seems pretty in-line with the current admission averages published by the university at the time of writing.
Demographics: High school extracurricular activities

High school Extracurricular Activities

- Member in a student club
- Organized sports
- Local volunteering
- Leader in a student club
- Non-engineering related job
- Art/Music/Theatre/Film
- Leadership Program
- Start an organization/company/club
- Religious activities
- None
- Engineering related job
- FIRST Robotics

Percentage of Respondents

0%  5%  10%  15%  20%
More than half of the respondents entered SYDE from some type of accelerated program.
Demographics: How did you discover SYDE?

Anecdotally, word of mouth has always been said to be the most common way that people find out about SYDE.
Surprisingly, although most of our class ended up in software or software-adjacent co-op positions by 4th year, computer science was not as popular as science or health science.
Demographics: Desired industry before university

Before starting university, our interests were all over the place.
Co-op
Salaries, Locations, Industries, Brain Drain
Co-op: Employment Rate

Almost $100$. 

![Co-op Employment Rate Graph](image-url)
Co-op: Job search method

As terms progressed, we became less dependent on Jobmine / Waterloo Works for getting a job.
Product Management was the only co-op job that consistently grew in popularity over time.
Co-op: Job location by term

As the terms went by, more of us found ourselves outside of Canada for co-op.
The software industry became increasingly popular.
Co-op: Company size by term

What size was the company when you worked there?

- Extra Large (1000+)
- Large (250-1000)
- Medium (50-250)
- Small (10-50)
- Micro (<10)
- Unemployed
Outstanding
“This rating is reserved for only those few students who have distinguished themselves by their unique contribution or exceptional performance.”[1]

Perhaps the co-op performance rating scale needs some reassessment.

Or maybe we’re just that great.

Show this to your employer, we won’t mind.

While the median co-op salary increased over time, so too did the salary variability.
Co-op: Average co-op salary over 6 terms

On average, each student made an average of 29.87 CAD/hr over their 6 co-op terms. Assuming a 37.5 hour work week and 16 week co-op terms, average total co-op income was 107,532 CAD.
Over the 6 co-op terms, the average co-op salary was 30.48 CAD/hr for males and 28.90 CAD/hr for females. Females made 1.58 CAD/hr less than males on average.
Though no strong relationship was identified, it does seem that a higher cumulative average invited a higher pay ceiling.
There is not a strong correlation between average co-op salary and parental income. However, it is interesting that the average co-op salary was lower when parents made $300k+.
Students whose parents finished college or university had higher average co-op salaries.
# Co-op: Ethnicity vs salary

<table>
<thead>
<tr>
<th>Which ethnic background(s) do you identify with?</th>
<th>Average Co-op Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asian</td>
<td>31.22 CAD/hr</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>33.82 CAD/hr</td>
</tr>
<tr>
<td>South Asian</td>
<td>30.44 CAD/hr</td>
</tr>
<tr>
<td>Southeast Asian</td>
<td>29.69 CAD/hr</td>
</tr>
<tr>
<td>White</td>
<td>27.64 CAD/hr</td>
</tr>
</tbody>
</table>
Over time, the GTA became a less popular location while the Bay Area became more popular. This meant that rent prices increased as less people could live with their parents and more people had to pay Bay Area rent.
Co-op: Commute

Commute times were high during the first co-op term because many students lived with their parents. Afterwards the median commute time was less than 30 minutes.
Mean co-op stress remained relatively constant throughout the terms.
School
Grades, Courses, Attendance, Exams
1B, 4A, and 4B median averages were higher than other terms.
Our class’ cumulative average was centered right around 80.
The average cumulative average was 79.72% for males and 79.67% for females.

There did not seem to be a relationship between gender and marks.
### School: Ethnicity vs marks

<table>
<thead>
<tr>
<th>Which ethnic background(s) do you identify with?</th>
<th>Average Cumulative Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asian</td>
<td>80.41%</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>81.54%</td>
</tr>
<tr>
<td>South Asian</td>
<td>78.07%</td>
</tr>
<tr>
<td>Southeast Asian</td>
<td>77.93%</td>
</tr>
<tr>
<td>White</td>
<td>80.17%</td>
</tr>
</tbody>
</table>
Students whose parents finished college or university had higher cumulative averages.
Senioritis in full swing.
Students with the highest grades typically went to more class. However, students who occasionally went to class had the second highest median cumulative average. This could be explained by differences in learning styles.
How many years did it take to finish your degree?

Number of Respondents

Number of years

0 5 6 7 8 9

School: Years to complete degree
School: When did you go on exchange?

When (if at all) did you go on exchange?

- Did not go on exchange
- 3B (January 2018)
- 3A co-op (September 2017)

In SYDE, 3B is traditionally the most frictionless and flexible term to go on exchange as it does not disrupt our co-op sequence.
Singapore was by far the most popular exchange destination.
School: Most interesting course

We had diverse interests.

**SYDE 332**
Introduction to Complex Systems

**SYDE 252**
Linear Systems and Signals

**SYDE 522**
Machine Intelligence
School: Most useful course

We made good use of our design-focused courses.

**SYDE 348**
User Centred Design Methods

**SYDE 162**
Human Factors in Design

**SYDE 223**
Data Structures and Algorithms
Management sciences electives were the most popular. This is partly because the management sciences degree option is the option that requires the least number of courses for SYDE students.
SYDE students liked to take technical electives from the SYDE department. Some of us just weren’t ready to leave E5.
69% of respondents never failed a course.
For a program called Systems Design Engineering, it’s good to know that for the most part, we were satisfied with the design aspects of our degree.
School: Would you choose SYDE again?

If you could go back in time, would you still do SYDE?

Yes

The majority of our class would do SYDE again.
Of the respondents who wouldn’t do SYDE again, everyone still wanted to be in an engineering or software-related program.
School: When did you join the SYDE 2019 cohort?

Most of our graduating class were from our original starting class.
School: Fourth year design project (FYDP) SYDE-only?

Did your FYDP group consist solely of SYDE students?

Yes

No

Percentage of Respondents
School: Are you proud of your FYDP?

Are you proud of your FYDP?

- Yes
- Somewhat
- No

Percentage of Respondents

Yikes.
School: Continue FYDP after grad?

Do you or your group plan to pursue your FYDP further beyond 4B?

No

Yes

Percentage of Respondents

Best of luck friends!
Tuition increased an average of 240 CAD/term. The total tuition cost for the degree was 67,529 CAD. This figure only reflects domestic tuition.
Rent was substantially higher in first year because of high residence costs.
2B was notoriously touted as being the most difficult term of them all, and the highest average stress rating for this term helps support this claim.
School: Cheating

Did you engage in any forms of cheating?

- Unauthorized collaboration
- Unauthorized use of previous term's materials
- Fabricating data
- Plagiarism
- Cheating in a test environment
- Falsifying Information

Just to be clear, no data was fabricated for this class profile.
Social & Lifestyle

Friends, Extracurriculars, Community, Mental Health
Social & Lifestyle: Friends in SYDE 2019

How many friends do you have in the SYDE 2019 class?

- 0-5
- 5-10
- 10-20
- 20-30
- 30+

We’re one big family after all.
Social & Lifestyle: Close friends in SYDE

Of your 5 closest friends you've made in university, how many are in SYDE?

We were a tight-knit bunch.
The majority of respondents attended a SYDE social event every term. It’s safe to say that we’re a pretty social class.
We were about more than just the class of 2019.
Social & Lifestyle: Contact with upper years

How many upper years are you still in contact with?

- 0: 35%
- 1-4: 45%
- 5-9: 10%
- 10+: 5%

Percentage of Respondents
Social & Lifestyle: Contact with lower years

How many lower years are you still in contact with?

- 0: 35%
- 1-4: 40%
- 5-9: 10%
- 10+: 5%

Percentage of Respondents
Social & Lifestyle: Cooking Ability

Growing up, colourized.
The class’ distribution of fitness did not change significantly.
“Carving your own path and finding out what's best for you will make you the happiest and most successful, try not to follow blindly or get wrapped up in the "hype" of what everyone else here does.”

“Take time to enjoy extracurriculars and find the things you like to do! You'll feel the academic pressure but it's important to realize that grades aren't everything. It took me too long to realize that and find a good balance.”

“At the end of it all, it'll be the relationships that matter (not the courses, not the grades, not even the coop jobs). Focus on building strong relationships that will last beyond university.”

“Experiment with different co-ops if you're not sure what you want and don't create artificial pressure for yourself because of what you hear from others.”

“You can't do engineering, especially SYDE, alone. Make friends with the people around you because they'll have your back countless times throughout the term, whether it be group members, lecture notes or late nights at the computer lab :^)”
Social & Lifestyle: University endeavours

Did you do any of the following during university?

- None: 9 respondents started or worked on an entrepreneurial venture.
Social & Lifestyle: Mental health concerns

Have you experienced any mental health concerns?

- None: 30% of Respondents
- Anxiety: 25% of Respondents
- Depression: 20% of Respondents
- Suicidal thoughts: 15% of Respondents
- OCD: 10% of Respondents
- Bipolar disorder: 5% of Respondents
- Dissociation: 1% of Respondents
- PTSD: 1% of Respondents
- Addictive disorder: 1% of Respondents
- Eating disorder: 1% of Respondents
Social & Lifestyle: Sources of anxiety and/or depression

What caused your anxiety and/or depression?

- Academics: 27%
- Co-op / Jobs: 25%
- Relationships: 20%
- Family: 13%
- Friends: 10%
- Extracurriculars: 3%
- Mix of all the above: 2%
- Not triggered by anything in particular: 2%
- I've always had some level of depression: 2%
- Lots of introspection and reflecting: 1%
- Guilt due to bad habits: 1%

Percentage of Respondents
Social & Lifestyle: Mental health support

Have you sought any forms of mental health support?

- No
- Support from family or friends
- Self help
- Engineering counselling
- University counselling
- Professional support outside UW
- No, but wish that I did
- Online communities
- Other university resources

Percentage of Respondents
How much of your university career, in months, was spent in a relationship?
Social & Lifestyle: How did you meet your significant others?

How did you meet your significant others?

- High school: 15%
- SYDE 2019: 13%
- Party/Social event: 12%
- Online/App: 12%
- Friends: 11%
- Co-op: 10%
- Extra curricular: 8%
- Orientation Week: 7%
- upper year SYDE: 5%
- Bar/Club: 4%
- Residence: 3%
- Travelling: 3%
- Exchange: 2%
- Electives: 2%
- lower year SYDE: 1%
Most respondents had 1 to 2 relationships over the course of university. Nobody had -1 so that’s positive!
On average, males had 1.97 relationships throughout university while females had 1.19 relationships.
Social & Lifestyle: Virginity

Before University
- Virgin: 78.2%
- Not Virgin: 21.8%

After University
- Virgin: 80.0%
- Not Virgin: 20.0%
How many unique sexual partners have you had in university, if any?

![Bar chart](chart.png)

Number of Respondents

Number of unique sexual partners
On average, males had 3.74 sexual partners throughout university while females had 2.33 sexual partners.
Social & Lifestyle: Recreational drugs

Which recreational drugs did you try for the first time?

- Marijuana: 30%
- None: 20%
- Alcohol: 15%
- Tobacco: 10%
- Adderall/Ritalin and equivalents: 5%
- Psilocybin (Magic mushrooms): 2%
- MDMA/Ecstasy: 2%
- LSD: 1%
- Nitrous Oxide (Whippets): 1%
- Salvia: 0%
Social & Lifestyle: Marijuana consumption

Marijuana consumption increased.

# Marijuana Consumption

<table>
<thead>
<tr>
<th>Frequency</th>
<th>First Year</th>
<th>Final Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Once a term</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Monthly</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Bi-weekly</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Weekly</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2-3/week</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4-7/week</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Alcohol consumption increased.
The Future

Jobs, Salaries, Brain Drain, Pay Gap, Life Plans
The Future: Debt

The majority of respondents graduated debt-free! This includes many students whose families funded portions of their education. The total cost of tuition was 67,529 CAD. The average total co-op income was 107,532 CAD. For many students, after tax and living costs this income was not enough for them to graduate debt-free.
The Future: Savings

How much do you have in savings?

- None
- 0-5k
- 5k-10k
- 10-20k
- 20-50k
- 50k+
- Prefer not to say

Percentage of Respondents

0% 5% 10% 15% 20% 25% 30%
The Future: What will you be doing in a year?

Most of our class planned to be working within a year of graduating.
For your career, what do you care about most?

- Job satisfaction: 40%
- Work/life balance: 30%
- Impact on society: 10%
- Compensation: 5%
- Prestige: 5%

Job satisfaction and work/life balance are most important to us.
Brain drain is real.

The most cited reason for leaving Canada was opportunities and pay, followed closely by a desire to explore and have new experiences.
The Future: Location

What city will you be working in?

- Bay Area: 30%
- GTA: 25%
- New York: 15%
- KW: 10%
- Seattle: 10%
- Other Canada: 7%
- Other USA/International: 3%
The Future: Do you consider this city to be within your hometown/region?

- No: 70% of respondents
- Yes: 30% of respondents
The Future: Brain gain

Of those leaving, do you plan to come back to Canada?

- Yes
- Not sure
- No

Ô Canada!
Terre de nos aïeux

For those that plan to return to Canada, the almost universally cited reason was existing family and other relationship ties.
The Future: If you are leaving Canada, when will you return?

When do you plan to return?

- **1 year**: 9%
- **2-3 years**: 18%
- **4-7 years**: 27%
- **7-10 years**: 9%
- **20+ years**: 5%
- **Not sure**: 36%

Percentage of Respondents
For those who already have jobs, the average total compensation in the first year is 173,387.08 CAD. This figure includes salary, signing bonus, equity, all other forms of compensation.

Note that of the respondents, 56% are moving to the United States for their full-time position. This helps to account for the wide range of compensation.
The Future: Industry

This is quite different from the industries we were interested in before university.
The Future: Job offer date

August to October lines up with the standard new graduate recruiting timeline.
The Future: Working for a previous company?

Will you be working for a company you interned at?

- Yes: 65% of respondents
- No: 35% of respondents
The Future: Industry in 10 years

Our interests skew much more towards the software industry than when we began university.
The Future: In 10 years, how many 2019 SYDEs will you be in touch with?

- 0
- 1-5 BFFs
- 5-10
- 10-15

Percentage of Respondents
The Future: Do you plan to pursue any higher education?

The majority of respondents want to pursue further education.
The Future: Age for marriage

If you intend to get married, at what age do you expect to do so?

Nobody likes you when you're 23 (or 24).
The Future: Age for marriage separated by gender

Expected marriage age separated by gender

Proportion of Respondents

Age

Male
Female
The Future: Age for children

If you intend to have children, at what age do you expect to do so?

Number of Respondents

Age

28 30 32 34
The Future: Age for children separated by gender

Expected age to have children separated by gender

- Male
- Female
The majority of the respondents plan on making alumni donations in some capacity.
Closing Remarks

Thank you for your time!
Shoutouts

**Joey Loi** and **Atef Chaudhury** for creating the original [Systems Design Engineering 2017 Class Profile](#).

&

**Krishn Ramesh** for following up with the [Systems Design Engineering 2018 Class Profile](#).

They’ve inspired us to continue the SYDE class profile project and hopefully turn this into a new class tradition.

Much of the process and structure of this profile was borrowed from their original resources and iterated upon with their guidance.
Final Thoughts

Thank you for your interest in learning about the Systems Design Engineering class of 2019!

If you are interested in conducting your own class survey, you may find our repository a helpful starting point.

Have any thoughts or questions about the profile? Let us know what’s on your mind:

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